

REMARKS

Reconsideration and allowance of this application, as amended, is respectfully requested.

This Amendment is in response to the Office Action dated October 8, 2008.

By the present amendment, the title has been amended, as required in paragraph 2 on page 2 of the Office Action. Therefore, removal of the objection to the title is respectfully requested.

Also by the present amendment, the original claims 1-9 have been replaced with new claims 10-17. These new claims have been drafted to specifically avoid the points of rejection raised in the 35 USC §112, second paragraph, rejection against the original claims. Therefore, reconsideration and removal of the 35 USC §112, second paragraph, rejection is respectfully requested.

Reconsideration and removal of the 35 USC §103 rejection against the new independent claim 10 based upon the cited primary reference to Usami (USPub. 2001/0012645) in view of Aizawa (USPub. 2001/0038280) and Masaharu (JP 2000-331830) is also respectfully requested. By the present amendment, a feature of the invention discussed, for example, in paragraph [0031] of the published application 2006/0260546 for the present application is clarified. Specifically, as shown in Figs. 1(b) and 1(c), the semiconductor device of the present invention is formed by first forming an oxide film layer 802 on a semiconductor substrate 105 followed by forming a device layer 104 on the oxide film layer 802 (as shown in Fig. 1(b)) followed by removing the semiconductor substrate 105 (e.g., Fig. 1(c)). The reason for this is described in paragraph [0031] of the published application as follows:

"FIG. 1(c) shows an embodiment in which the semiconductor substrate including the substrate bottom surface is completely removed. This ultimate structure is effective for not generating a wasteful eddy current. A substrate principal surface is a surface on which elements constituting circuits are formed, whereas the substrate bottom surface is a surface opposite to the substrate principal surface. The device layer is a layer formed on the substrate principal surface side and made of elements and wirings constituting circuits."

Independent claim 10 defines such an arrangement with a device layer and an oxide film layer "laminated in this order from the top to the bottom" together with the further limitations of:

"said on-chip coil antenna is configured to receive a microwave of 2.45 GHz; a thickness of said on-chip coil antenna is set to 2.6 μ m or thicker; and a width of said on-chip coil antenna is set from 2.6 μ m to 10 μ m."

In other words, an overall combination is defined which includes the laminated two layer structure of the device layer and the oxide film layer together with the specific recitations of the configuration of the antenna to receive a specific microwave frequency, the setting of the thickness of the on-chip coil antenna to a specific thickness (or greater) and the setting of the width of the on-chip coil to fall within a specific range of 2.6 μ m to 10 μ m. It is respectfully submitted that neither Usami nor Aizawa (or Masaharu for that matter) teach or suggest this claimed combination of features.

Beginning five lines from the bottom of page 4 of the Office Action and bridging onto page 5, it is stated that Usami discloses that the shape and size of the antenna may vary depending on the frequency to be used and that Aizawa teaches a conductive material on a semiconductor chip utilizing gold and "that when such a conductor carries high frequency signals (like an antenna), the thickness of the

conductive material is a known variable.” Therefore, on page 5, the Office Action goes on the state:

“It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Usami so that the conductive material is gold, that the semiconductor substrate is a silicon substrate, and that a width and a thickness of said antenna is set to 2.6 μ m or larger and 10 μ m or smaller.”

In response, it is noted that the dimensions have been clarified, as noted above. It is further noted that the semiconductor substrate has been eliminated from the independent claim 10 to obtain the advantage of reduced eddy currents, as discussed above. As a result, it is respectfully submitted that a limitation that the thickness of the on-chip coil antenna is set to 2.6 μ m or thicker and the width of the on-chip coil antenna is 2.6 μ m to 10 μ m which is clearly not defined in either of the cited references to Usami or Aizawa.”

More specifically, it is respectfully submitted that Usami simply discloses that the shape of the antenna can differ in accordance with the frequency to be used. There is absolutely nothing in Usami which suggests actual practical dimensions for the on-chip coil antenna such as set forth in the present claim 10. Further, Aizawa only discloses in paragraph [0205] a lower limit of thickness or width of the coil antenna, without specifying any upper limit. As such, there is no teaching or suggestion whatsoever which would lead to the claimed range for the width of the on-chip coil antenna set forth in independent claim 10. Therefore, reconsideration and allowance of newly presented claim 10 over the cited prior art is earnestly solicited.

Reconsideration and allowance of new independent claims 16 and 17 over the cited prior art is also respectfully requested. These claims each include all of the limitations discussed above for claim 10, together with further limitations emphasizing the above-noted feature that the substrate is removed from the lower surface of the oxide film layer (e.g., compare Fig. 1(b) and 1(c) of the present application, together with the discussion in paragraph [0031] of the published application). In particular, independent claim 16 defines:

“wherein the semiconductor device further includes means for avoiding generation of eddy currents, said means comprising said oxide film layer being formed on a semiconductor substrate, said device layer being formed on said oxide film layer and said semiconductor substrate then being removed so that a lower surface of the oxide film layer is not adjoined to a semiconductor substrate to thereby avoid generation of eddy currents due to said semiconductor substrate.”

As such, independent claim 16 sets forth the invention in accordance with the provisions of 35 USC §112, sixth paragraph, as a means for avoiding generation of eddy currents. The recitations of independent claim 16 correspond with the disclosure concerning Fig. 1(b) and 1(c), as well as the discussion found in paragraph [0031] of the published application for this case. Clearly there is absolutely no teaching or suggestion whatsoever of such a means for avoiding generation of eddy currents by removal of the substrate in either Usami or Aizawa.

Indeed, the Office Action clearly points out that the primary reference to Usami specifically includes a semiconductor substrate 12. Therefore, it is respectfully submitted that independent claim 16 even further emphasizes the above-noted distinctions over the cited prior art.

With regard to independent claim 17, this claim defines the feature of removing the semiconductor substrate in terms of method language. As noted in the case of *In Re Luck* (177 USPQ 523):

"As for the method of application, it is well established that product claims may include process steps to wholly or partially define the claimed product ...to the extent these process limitations distinguish the product over the prior art, they must be given the same consideration as traditional product characteristics."

In the present instance, as noted in paragraph [0031], the process step of removing the semiconductor substrate from the lower surface of the oxide film layer leads to a direct improvement in the resulting product, that is, reduced eddy currents.


Therefore, reconsideration and allowance of newly presented independent claim 17 is also respectfully requested.

Finally, reconsideration and allowance of the dependent claims 11-15 is also respectfully requested. In each instance, these claims define specific further features of the present invention which, when considered in combination with the features of the independent parent claim 10, define overall combinations neither taught nor suggested by the references to Usami and Aizawa or the further secondary cited prior art to Masaharu. Therefore, reconsideration and allowance of these dependent claims is also respectfully requested.

If the Examiner believes that there are any other points which may be clarified or otherwise disposed of either by telephone discussion or by personal interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Antonelli, Terry, Stout & Kraus, LLP Deposit Account No. 01-2135 (Docket No. 500.45802X00), and please credit any excess fees to such deposit account.

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP

By /Gregory E. Montone/ 
Gregory E. Montone
Registration No. 28,141

GEM/dks
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209
Telephone: (703) 312-6600
Facsimile: (703) 312-6666